TABLE OF CONTENTS
AVENAL ENERGY AFC

TABLE OF CONTENTS
AVENAL ENERGY AFC
(Continued)

TABLE OF CONTENTS
AVENAL ENERGY AFC
(Continued)

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

1.0 EXECUTIVE SUMMARY

1.1 PROJECT OVERVIEW

Duke Energy Avenal, LLC (Duke Avenal), the Applicant, is seeking approval from the California Energy Commission (Commission) for the construction and operation of the Avenal Energy project (the Project). The Project consists of a state-of-the-art 600 megawatt (MW) combined-cycle electric power generating plant and ancillary facilities. The Project will be located on a portion of an approximately 148-acre site (the Site) in a planned industrial park in the City of Avenal, Kings County, California. The Project design incorporates advanced combustion turbine technology and state-of-the-art emissions control systems to provide California electric customers with additional electric capacity in the form of an environmentally sound, efficient electric generating facility to sell electricity into California's deregulated electric energy market. Duke Avenal's Project objectives are to:

- Provide environmentally sound, efficient and reliable power generation for California's restructured energy market.
- Use a location that has existing nearby infrastructure (i.e., existing transmission lines, water supply and gas supply) with available capacity and supply to support the Project.
- Develop a site consistent with community planning and existing zoning, at a location that is supported by the local community.
- Minimize impacts to environmental resources.

Key Project features and benefits of the proposed Project include:

- Provides direct employment by creating an average of approximately 240 construction jobs and 30 full-time jobs for operation of the plant.
- Contributes to the local economy by the purchase of goods and services during Project construction and provides sales and property tax revenues and employment during Project operation.
- Provides increased electrical power to the grid capable of supporting about 450,000 homes or small businesses.
- The Project is consistent with City of Avenal land use plans and zoning. It will be located away from developed urban areas and surrounded by agricultural lands.
- The Project will connect to existing nearby industrial infrastructure, including water and gas supplies and electrical transmission lines. The short infrastructure tie-ins will minimize environmental impacts of linear facilities.

- The Site and infrastructure tie-ins occur on lands that have been extensively disturbed by agricultural activity. No disturbance of natural vegetation or wildlife habitat will occur.
- The Project will bring new municipal and industrial water into Kings County and have no negative affect on water for agriculture.
- The facility will be designed to minimize water consumption by recycling water to the maximum extent possible through the installation of a zero liquid discharge facility (ZLDF).
- The ZLDF will also eliminate wastewater discharge from the Project.

Duke Avenal's Application for Certification (AFC) has been prepared in accordance with Commission guidelines and provides:

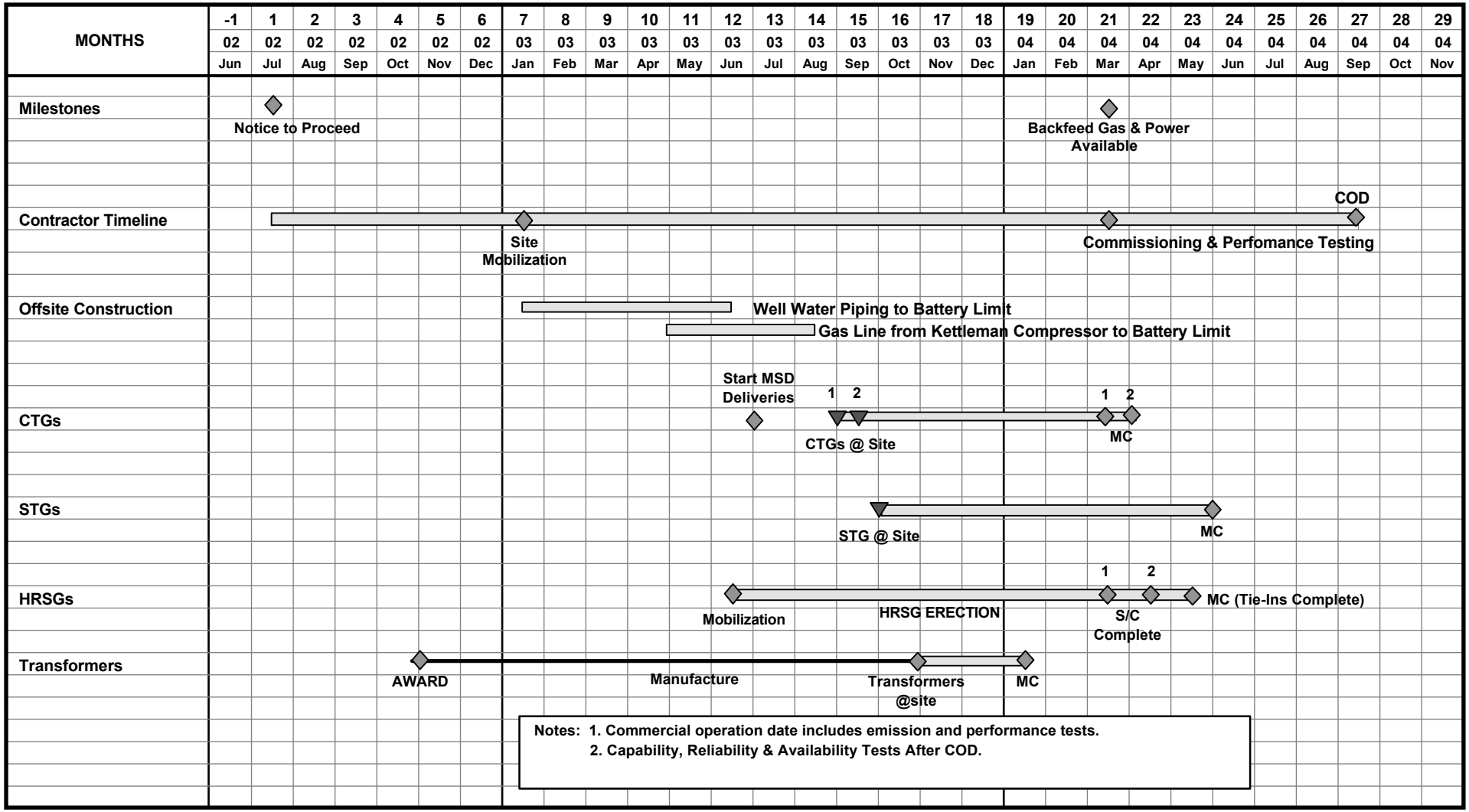
- A description of the Project.
- An assessment of Project impacts on the existing environment.
- Proposed design features to assure that environmental issues are properly and responsibly addressed.
- Discussion of compliance with applicable laws, ordinances, regulations and standards (LORS).

1.2 PROJECT NEED

By supporting local and Central San Joaquin Valley load, the Project will improve electric supply reliability in this region. Loads in Fresno and surrounding areas will grow as well as agricultural demands in the Central San Joaquin Valley. Furthermore, the addition of generating capacity at this Site provides additional reactive power capability that will act to improve area transmission system voltage. The addition of the 600 MW combined-cycle generation plant results in more firm generation available for direct local service to the San Joaquin Valley area loads.

1.3 PROJECT SCHEDULE

A preliminary Project schedule is provided in Figure 1.3-1. Construction of the Project is expected to begin early in the first quarter of 2003 and be completed in the third quarter of 2004, a total of approximately 20 months. Initial start-up and plant testing will occur during the first and the second quarter of 2004 and the Project's expected commencement of commercial operation is September of 2004.



COD = Commericial Operation Date
MSD = Material Shipped Direct
MC = Mechanical Completion
SC = Subcontract

PRELIMINARY PROJECT SCHEDULE

DUKE ENERGY AVENAL, LLC

AVENAL ENERGY | **FIGURE 1.3-1**

1.4 PROJECT OWNERSHIP

Duke Avenal, a Delaware Limited Liability Company and wholly owned subsidiary of Duke Energy North America, will be the owner of the generating plant and the Site. Duke Avenal will also own the natural gas pipeline that connects to Pacific Gas & Electric's (PG&E's) Kettleman compressor station, and the water pipelines that deliver water from the City of Avenal turnout and nearby backup water supply wells. The electric transmission line that connects the generating plant to the PG&E transmission line will be owned by PG&E.

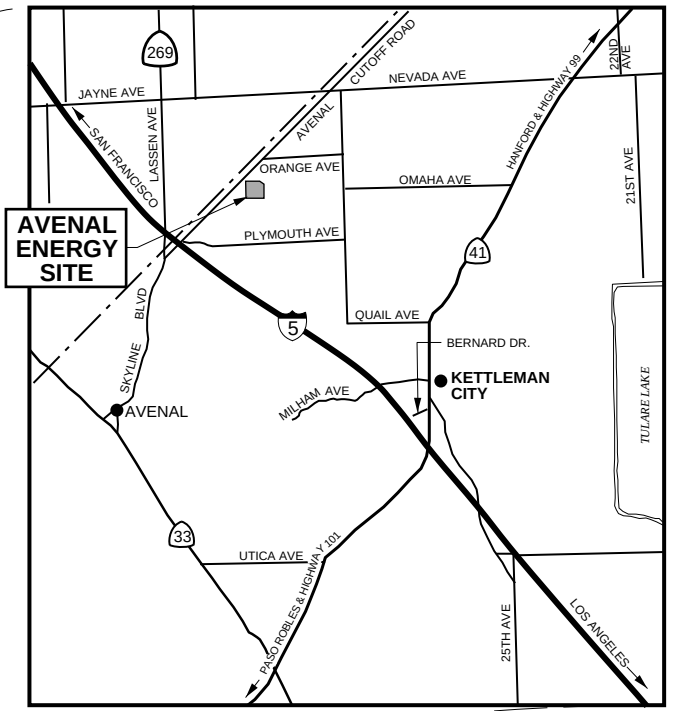
Duke Energy Corporation, the parent company of Duke Energy North America, is a global energy company with assets that include retail and wholesale electric operations, interstate natural gas pipelines, natural gas gathering and processing and natural gas liquids facilities. Duke Energy Corporation's business units are recognized nationally for excellence in customer service, power plant operations and efficiency, and their commitment to and expertise in environmental stewardship. In California, subsidiaries of Duke Energy North America operate four power plants.

1.5 FACILITY LOCATION AND DESCRIPTION

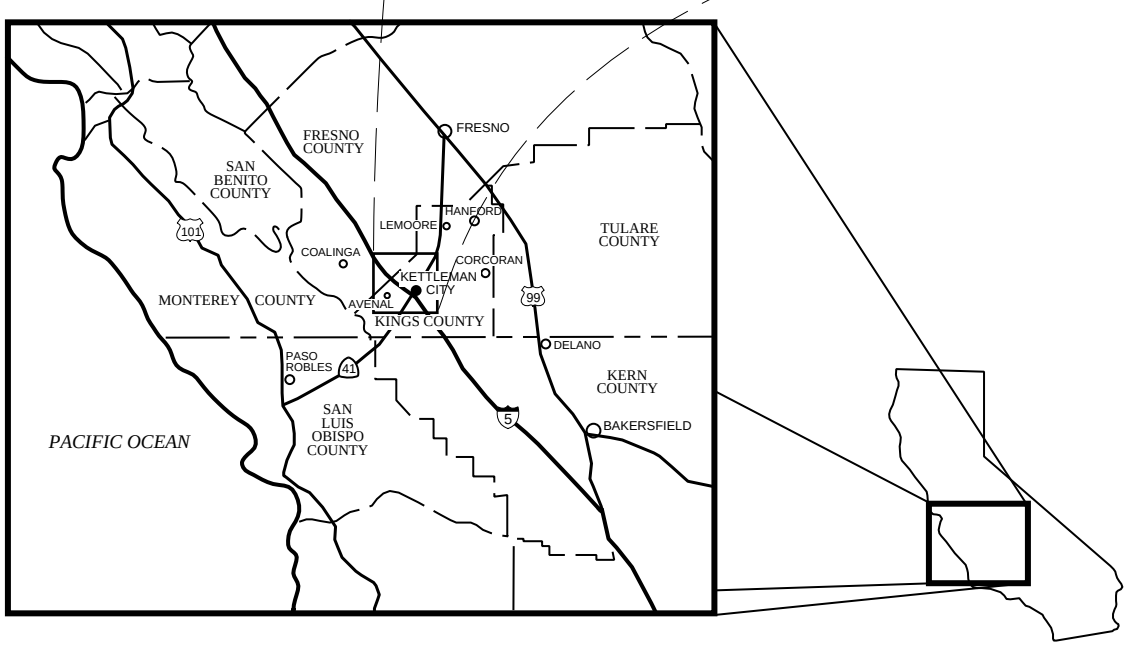
1.5.1 FACILITY LOCATION

The Site and each of the infrastructure tie-ins are located entirely in areas that have been extensively disturbed by agriculture and infrastructure development and, consequently, no natural habitat will be impacted. The Site and the City of Avenal are located in the agricultural region of the southwestern San Joaquin Valley (Figure 1.5-1). While the Site is within the city limits of the City of Avenal, it is separated from the residential and commercial districts of the City by the intervening topography of the Kettleman Hills and by a distance of about 6 miles (Figure 1.5-2). The City of Avenal has planned the Site area for development of an industrial park in part due to its proximity to Interstate 5 and to the natural gas supply at the Pacific Gas and Electric (PG&E) Kettleman compressor station. The location of the Site for the power generation facility and switchyard, the connecting electrical transmission line, the gas supply pipeline and water pipelines are shown in Figure 1.5-3. Table 1.5-1 provides a "fact sheet" for the Project.

00-311AFC-70 REV 09/21/01



VICINITY MAP
NOT TO SCALE



REGIONAL MAP

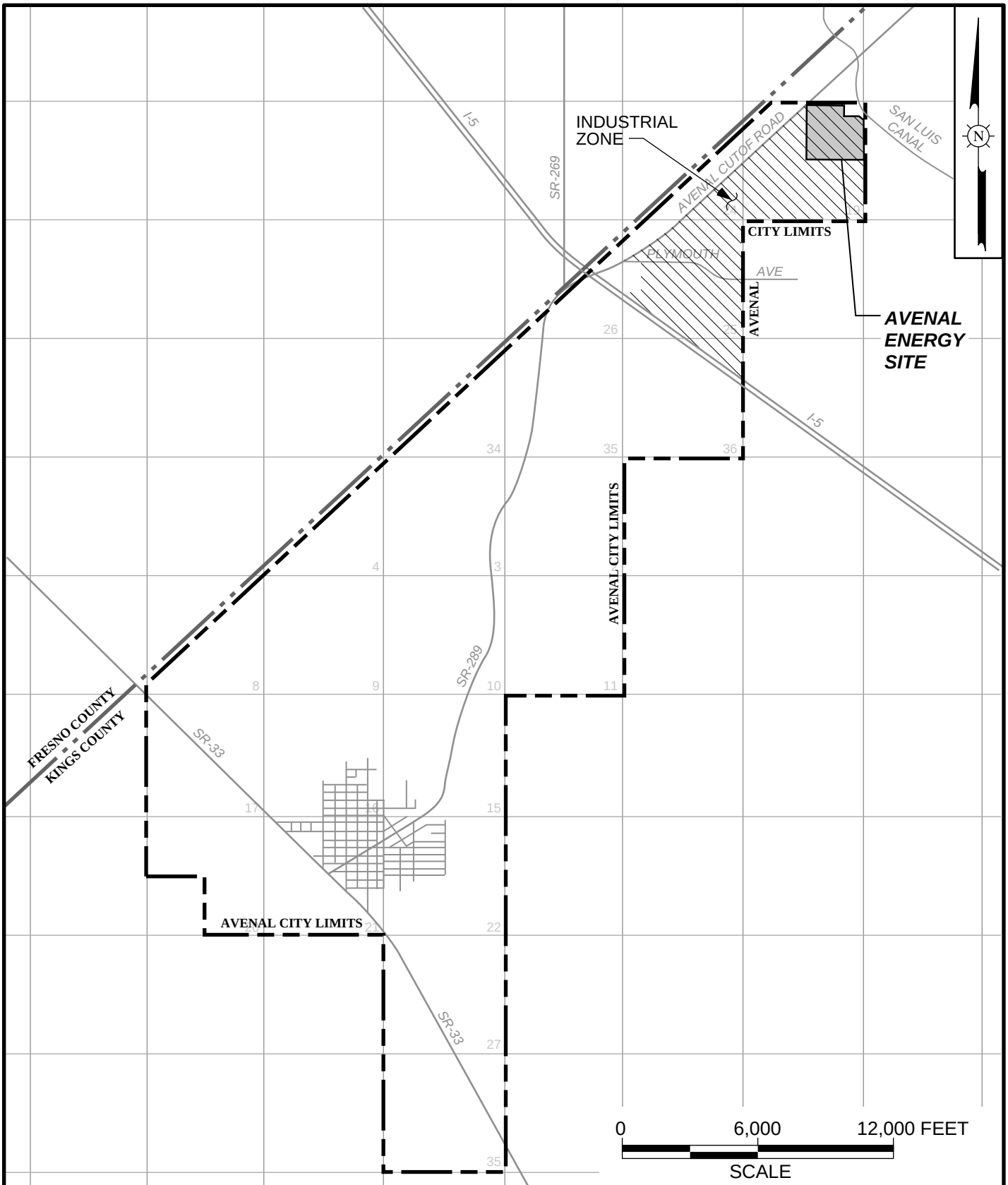
0 60 120 MILES

APPROXIMATE SCALE

REGIONAL LOCATION MAP

DUKE ENERGY AVENAL, LLC

AVENAL ENERGY	**FIGURE 1.5-1**



LEGEND

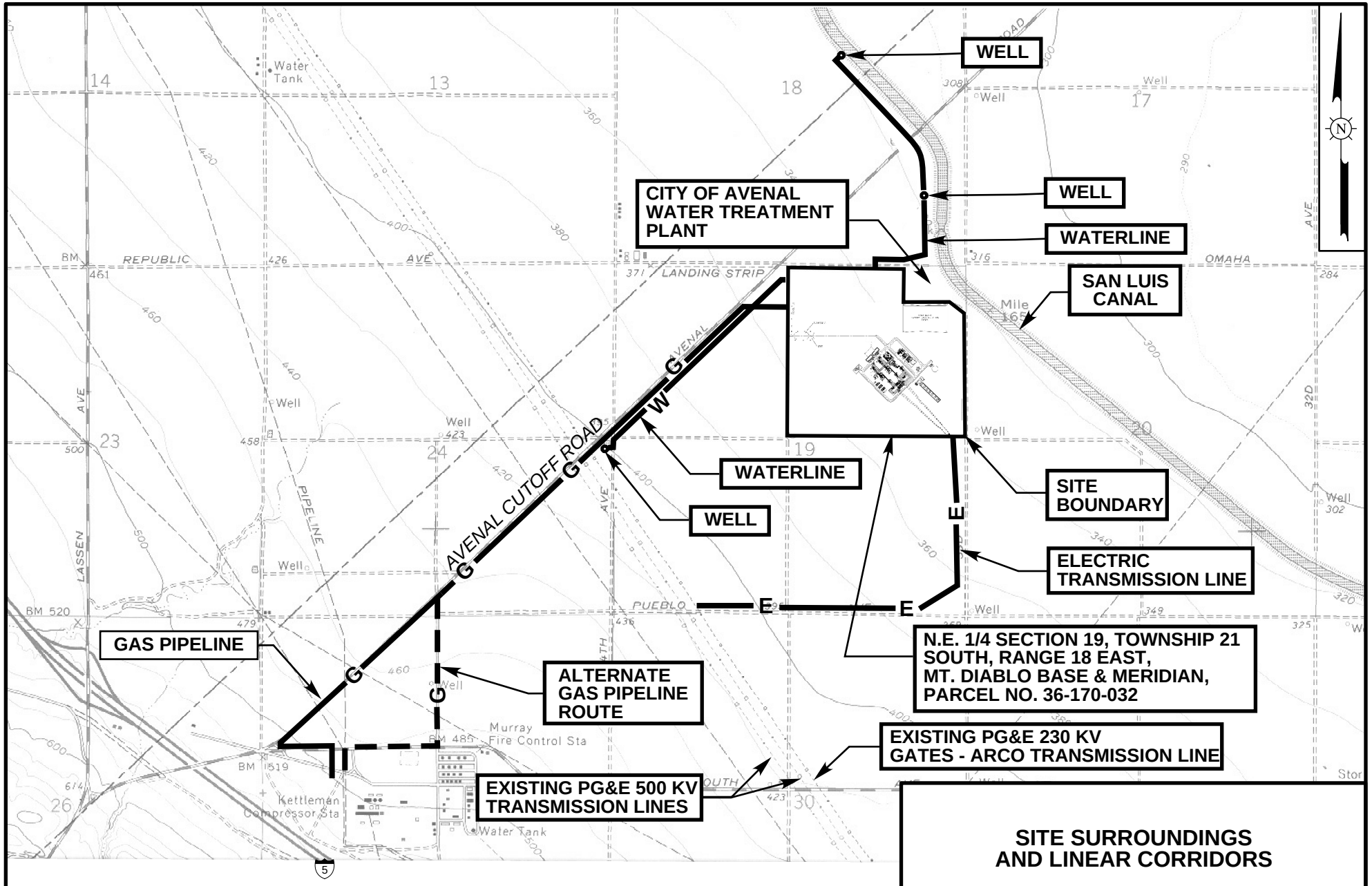
INDUSTRIAL ZONE (CITY OF AVENAL GENERAL PLAN AND ZONING ORDINANCE)

REFERENCE: CITY OF AVENAL GENERAL PLAN, EXHIBIT 2.

SITE LOCATION

DUKE ENERGY AVENAL, LLC

AVENAL ENERGY | **FIGURE 1.5-2**



REFERENCE:
U.S.G.S 7.5 MINUTE TOPOGRAPHIC SERIES MAP
OF LA CIMA, CALIFORNIA, DATED 1978.

0 2,000 4,000 FEET
SCALE

SITE SURROUNDINGS AND LINEAR CORRIDORS

DUKE ENERGY AVENAL, LLC

AVENAL ENERGY | **FIGURE 1.5-3**

TABLE 1.5-1
AVENAL ENERGY
FACT SHEET

SITE CHARACTERISTICS	MAJOR EQUIPMENT	SOCIOECONOMIC BENEFITS	ACREAGE	DISTANCES (APPROXIMATE)	WATER
• Site setting: Site and adjacent lands occupied by row crops and orchards. • Site first cleared of native vegetation: 1951 (actively farmed since that time). • Acreage of Project disturbance to natural vegetation or habitat: Zero (entire site and linear facility routes are 100% disturbed). • Existing Site elevation: Approximately 320-360 feet. • Finished power block elevation: Approximately 340 feet for the conceptual grading. • Average rainfall: 6 to 7 inches per year. • Temperatures: High 30s to low 100s (ºF).	• Nominal net output: 600 MW. • Combustion turbines: 2 GE 7FA 180 MW each. • Steam Turbine: GE 300 MW (nominal). • CTG inlet air chillers. • 2 Stacks: 145 feet high. • Diameter of stacks: 19 feet. • Plant cooling tower: 7 cells, 45 feet high. • HRSG height: 91 feet. • Length of Project's natural gas pipeline: 2.5 to 2.8 miles. • Diameter of Project's natural gas pipeline: 20 inches. • Zero liquid discharge facility (ZLDF) to maximize water efficiency.	• Capital Cost of Project: $325 million. • Construction period: 20 months. • Average construction work force: 240 people. • Approximate peak construction work force: 425. • Operation work force: 30 full time positions. • Project will bring a new supply of water to Kings County without impacting water supply in surrounding areas. • Estimated property tax revenue from Project: Approximately $3.25 million per year. - City of Avenal: Approximately $600,000 per year. - Kings County: Approximately $960,000 per year. - Local Schools: Approximately $1.35 million per year.	• Permanent facilities: Approximately 25 acres. • Temporary (construction only): 51 acres. • Site: Approximately 148 acres of row crops.	• Kettleman compressor station: 7,000 feet. • Closest distance to existing electrical transmission lines: 3,000 feet. • Closest distance to San Luis Canal: 200 feet. • City of Avenal business and residential districts: 6 miles. • Avenal Airport: more than 7 miles (closest airport, no others within 10 miles). • Avenal Landfill: 2 miles. • City of Huron: 8 miles. • City of Coalinga: 16 miles. • City of Hanford: 28 miles. • Interstate 5: 2 miles. • Kettleman Hills: 2 miles. • Kettleman City: 10 miles. • City of San Francisco: 200 miles. • City of Los Angeles: 200 miles. • Closest farmhouse to the Northeast: 1.3 miles. • Closest farmhouse to the Southwest: 1.8 miles. • PG&E Gates substation: 5 miles. • From Gates to ARCO: 34 miles. • From Midway to ARCO: 44 miles.	• Firm water supply: Kern County Water Agency (via San Luis Canal). • Backup water supply: Limited use of wells as a backup will be offset by conservation measures. No net increase in groundwater pumping will occur. • Onsite water storage: 2,000,000 gallons. • Reserve for fire protection system: 240,000 gallons. • Annual water use: 2,246 acre-feet per year. • Average daily use: 1,393 gallons per minute.

31161 Rpts/AFC/Tbls&Figs (10/5/01/jb)

The Site encompasses approximately 148 acres and constitutes the majority of the northeast quarter of Section 19, Township 21 South, Range 18 East, Mt. Diablo Base and Meridian (Figure 1.5-3). Duke Avenal has secured a purchase option for the Site, which is located on a portion of Kings County Assessor's Parcel No. 36-170-032. Site facilities (including the power block, switchyard, ZLDF, cooling tower and storm water retention basin) will occupy approximately 25 acres within the 148-acre Site. In general, the Site is surrounded by open farmland except for a City of Avenal potable water treatment facility located in the northeast corner of the quarter section. Full-page color photographs of the Site prior to and after construction are shown in Figures 1.5-4 and 1.5-5. A list of current tax assessor's parcel numbers and owner's names and addresses for parcels within 500 feet of proposed linear facilities and within 1,000 feet of the Site are included in Appendix 1.0-1.

1.5.2 FACILITY DESCRIPTION

The Project will produce a nominal electrical power output of 600 MW for delivery to California's grid system using clean-burning natural gas. The Project has been located and designed to minimize environmental impacts. The Site is zoned industrial and is located close to existing gas, water and electrical transmission infrastructure facilities so that only short linear facility tie-ins are required. Natural gas for the Project will be provided via an underground pipeline interconnection to the PG&E Kettleman compressor station located approximately 7,000 feet southwest of the Site. The Project will deliver electric power to the PG&E transmission grid through a new, on-site 230-kV switchyard by constructing approximately 7,000 feet of new, double circuit 230-kV line to loop the existing PG&E Gates-ARCO 230-kV line into the Site. The primary source of raw water for the Project will be surface water supply delivered via the San Luis Canal. The Kern County Water Agency (KCWA) will provide local water for the Project by exchange in an amount sufficient to meet the estimated annual average and maximum daily water demand for the Project, and a backup water supply has been secured from nearby existing groundwater wells(1). The Project will include a ZLDF that will purify and recycle process water, minimizing water consumption and eliminating process wastewater discharge.

The facility, to be known as Avenal Energy, is arranged with two trains of Combustion Turbine Generator (CTG)/Heat Recovery Steam Generator (HRSG) to one Steam Turbine Generator (STG) (two-on-one configuration). The two (2) advanced natural gas-fired model PG7241

(1) Project use of groundwater will be offset by equivalent reductions in agricultural groundwater pumping.

"7FA" class CTGs supplied by General Electric Power Systems are equipped with dry low NO_x combustors designed for natural gas and inlet-air mechanical chillers to enhance output at higher ambient temperatures. The HRSG raises steam at three pressures. The exhaust from the steam turbine discharges into a surface condenser operating under vacuum. The steam is condensed by circulating cooling water, which rejects the heat with a mechanical draft cooling tower. Dry low NO_x combustors in the CTGs are followed by selective catalytic reduction (SCR) in the HRSGs to control NO_x stack emissions. An oxidation catalyst located within each HRSG reduces the concentration of carbon monoxide (CO) and volatile organic compounds (VOC) in the exhaust gases exiting the stack.

Each of the CTGs and the STG generate electrical energy at 18 kilovolts (kV). Each generating unit will be connected to the 230-kV grid through 18/230-kV step-up transformers. The 230-kV side of these transformers will be connected to an onsite 230-kV switchyard which will be integrated into the Gates-ARCO 230-kV line.

1.5.3 TRANSMISSION INTERCONNECTION

The proposed interconnection with the existing PG&E transmission grid will be accomplished by "looping" the existing PG&E Gates-ARCO 230-kV line from the PG&E transmission line corridor west of the Site to the onsite switchyard. This line will consist of approximately 1.3 miles of new double circuit 230-kV line that will follow the route shown in Figure 1.5-3. The new line will be located on a 120-foot-wide right-of-way.

1.5.4 FUEL SUPPLY

Natural gas is supplied to the Project through the PG&E pipeline network. Natural gas will be conveyed to the Site via a new 20-inch diameter, 2.5-mile underground pipeline interconnection from existing PG&E Lines 300 A/B at a point in the PG&E Kettleman compressor station located southwest of the Site. Figure 1.5-3 illustrates the proposed route of the new interconnecting line.

1.5.5 WATER SUPPLY

Project annual water demand will be approximately 2,250 acre-feet/year (AFY). The primary source of water for the Project will be a municipal and industrial surface supply of 2,250 AFY from KCWA under a firm water supply contract delivered via the San Luis Canal. The water will be delivered

AVENAL SITE
BEFORE CONSTRUCTION

DUKE ENERGY AVENAL, LLC

AVENAL ENERGY	**FIGURE 1.5-4**

AVENAL SITE
AFTER CONSTRUCTION

DUKE ENERGY AVENAL, LLC

AVENAL ENERGY	**FIGURE 1.5-5**

to the City of Avenal turnout adjacent to the Site. This surface water supply will meet the Project's projected annual and maximum daily needs and is not subject to State Water Project (SWP) shortages.

The Project will have a backup water supply from nearby agricultural wells via approximately 1.6 miles of new water pipelines to connect the Site to the wells. The backup ground water supply will be used on a limited basis and will be offset by conservation measures to ensure no net increase in groundwater pumping.

1.5.6 WASTEWATER DISPOSAL

The Project will have separate plant wastewater and sanitary wastewater collection systems. A general plant drainage system collects storm water from the contained or curbed power block areas and process blowdown from plant equipment and general plant drains. This collection system routes the process water to the ZLDF for treatment. The ZLDF recycles the water as purified distillate back to the power production cycle. The ZLDF treats the water by separating the water from the dissolved solids, then recycles purified distilled water (distillate). The brine slurry continuously withdrawn by the ZLDF is reduced to dry solids. The resultant dewatered salt cake will be disposed at a local nonhazardous landfill. Water recycling through the ZLDF will reduce project water consumption by approximately 10 percent.

The sanitary system will collect sanitary wastewater from sinks, toilets, and other sanitary facilities and discharge it to a permitted on-site septic system.

1.6 FACILITY OPERATION

The Project will be operated up to 7 days per week, 24 hours per day. Overall annual availability of the Project is expected to be approximately 90 percent or greater. The Project's capacity factor will depend on the demand for electricity and ancillary services. The design of the Project provides for operating flexibility (i.e., ability to start-up, shut down, turn down, and provide peaking output) so that operations may be readily adapted to changing conditions in the energy market.

1.7 PROJECT ALTERNATIVES

A number of alternatives to the Project were considered, including the "no project" alternative (see Chapter 5.0 of this AFC). The Project as planned minimizes environmental impacts. In addition, the "no project" alternative fails to provide additional tax revenue to the local area or diversify the business base of Avenal and Kings County. A change in location of this Project adds no benefit, generally requires more infrastructure, and is less efficient in the support of Californian's electric needs as compared to the proposed Project.

Several alternative site locations for the Project were analyzed but were rejected due to unavailability or due to the potential to cause greater impacts to the environment than the proposed Site. Alternative generating technologies were also considered but rejected as being less fuel efficient, economically unfeasible in the deregulated electricity market, or causing greater impacts to the environment than the selected, natural gas-fired, combined-cycle technology. Alternative routes for the electric transmission line were considered but rejected as causing greater than or equal impacts to the environment.

Alternative power plant cooling technologies were evaluated including dry and hybrid cooling systems. Since the Project has acquired municipal and industrial water, there are no benefits from alternative cooling systems.

Alternative sources of water analyzed included sewage effluent and brackish water that occurs at shallow depth several miles east of the Site. Sufficient quantities of sewage effluent are not available. Brackish water use would require extensive pipelines and additional facilities to deliver and to treat the effluent, resulting in impacts to the environment that would be greater than the proposed source of water.

1.8 ENVIRONMENTAL CONSIDERATIONS

Seventeen areas of possible environmental impact from the Project were investigated. The Project will avoid or minimize potential environmental impacts through careful Site selection, an environmentally sensitive design, and incorporation of design features. As a result, the Project will have no significant environmental impacts. Detailed descriptions and analyses of these areas are presented in Sections 6.2 through 6.18 of this AFC.

1.8.1 AIR QUALITY

The Project will not have a significant adverse impact on air quality. The Project will control emissions of criteria pollutants including oxides of nitrogen (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO_2) and particulates less than or equal to 10 microns in diameter (PM_{10}). The Project will create a net reduction in regional emissions by providing emission reductions from other regional emission sources that exceed the emissions from the Project. In addition, the following mitigation measures will reduce the direct impacts of these pollutants to levels that are less than significant:

- The facility will incorporate the following state-of-the-art air pollution controls that reflect Best Available Control Technology (BACT) to reduce emissions:
  - Dry low NO_x combustor technology and selective catalytic reduction (SCR) to reduce NO_x emissions.
  - Oxidation catalyst to limit CO emissions.
  - Dry low NO_x combustor technology to limit VOC emissions.
  - Clean-burning natural gas as fuel to limit SO_2 and PM_{10} emissions.
  - High-efficiency drift eliminators in the cooling tower to reduce PM_{10} emissions.
- Short-term air quality impacts associated with construction activities will be reduced by compliance with the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) requirements, including the following measures:
  - Water trucks and sprinklers will be used to control dust.
  - The ground outside the Project will be left undisturbed to prevent wind erosion, or if feasible, agricultural practices can continue during construction.

As demonstrated by the air quality modeling, criteria pollutant emissions from the Project will not cause violations of federal or state ambient air quality standards. Therefore, in combination with the mitigation measures described above, no significant adverse affects on air quality from criteria pollutant emissions are anticipated.

1.8.2 GEOLOGIC RESOURCES AND HAZARDS

No significant geological or soil-related impacts are anticipated from the construction or operation of the Project. Implementation of the following design features will reduce the potential for any minor construction or operational impacts to a level of insignificance:

- An engineering geology report will be developed as part of Project siting design. The report will be developed in conformance with the most recent addition of the California Building Code (CBC), Appendix Chapter 33, Section 3309.3, Grading Designation. The report will be developed, signed and stamped by a California Certified Engineering Geologist. Final placement and design of the proposed facilities and foundations will follow the recommendations of the engineering geology.
- A detailed, site-specific seismic evaluation will be performed as part of Project siting design. This evaluation will determine the governing design ground acceleration, and will be coordinated with power plant structural design, as needed, to control any potential impacts associated with ground-shaking, in accordance with the CBC. The proposed facilities will be designed in accordance with the CBC Seismic Zone 4.

1.8.3 AGRICULTURE AND SOILS

The Site will occupy land that is designated and zoned industrial and located in an industrial park. Agricultural practices on lands adjacent to the Site will not be affected by the construction or operation of the Project. Water conservation measures will be implemented by the owner/operator of the surrounding lands to offset groundwater that will be pumped from wells for the Project backup water supply.

Beneficial aspects of the Project relative to agriculture and soils are:

- The Project will be located in an area that is designated and zoned industrial by the City of Avenal. There will be no conversion of land that is designated or zoned for agricultural use.
- The Project is not located on Williamson Act Lands.
- The Project has been designed in consultation with the owner/operator of the agricultural lands adjacent to the Site.
- Project design features assure that ground-level concentrations of air pollutants will have no significant impacts on agriculture and soil resources.

- The Project will provide additional electrical power to assure a reliable supply of energy for California, including agricultural uses.
- A large buffer zone will remain in agricultural production once construction is complete.

The Project will not significantly affect agriculture or soil resources.

1.8.4 WATER RESOURCES

Project water demands will be approximately 2,250 AFY. Surface water will be supplied by KCWA via the San Luis Canal under a firm water supply contract. Use of this water will not impact other water users in the area. A backup groundwater supply from nearby agricultural wells will be used on a limited basis. The Project's use of groundwater will be offset so there will be no net increase in groundwater pumping. Achievements of groundwater conservation will be accomplished by crop rotation and irrigation conservation measures.

The Project is designed to minimize consumptive use of fresh water to that which is minimally essential. The Project design includes a ZLDF. The ZLDF is a water treatment system that will recover process purge streams, primarily cooling tower blowdown, for treatment and recycling through the system. The ZLDF is a costly plant upgrade that will reduce water consumption and eliminate the need for process water disposal. With the ZLDF, Project water consumption will be reduced by approximately 10 percent. In addition, it will allow the Project to operate without evaporation ponds or other conventional wastewater disposal technology and with no liquid discharge from the facility.

The Project will be constructed and operated under the State General National Pollutant Discharge Elimination System (NPDES) permits for storm water discharges from construction and industrial activities. Best Management Practices (BMPs) will be implemented to minimize storm water contact with potential pollutants and to reduce or prevent pollutants from entering storm water. The BMPs will include an erosion control plan and other measures that will be implemented in accordance with the State General NPDES permit.

The following design and operational features of the Project avoid potentially significant environmental impacts:

- Use of KCWA local water will not alter diversions from the Delta to the California Aqueduct.

- Groundwater will be used under limited conditions as a backup supply. Groundwater use will be entirely offset so that the Project will not increase groundwater pumping in the basin.
- The Project will incorporate a ZLDF designed to eliminate off-site disposal of wastewater.
- The Project will occur entirely within areas that have been intensively disturbed, so there will be no impact to natural surface drainages or natural watershed areas.
- The Project linear facilities will not alter existing surface drainage. The gas pipeline interconnection will be underground. The water pipelines will be underground. The electrical interconnection line towers will not affect surface drainage.

1.8.5 BIOLOGICAL RESOURCES

Biological impacts will be minimal due to the Site location and characteristics. Due to its continuous farming use, the Site and Project linear corridors contain no native vegetation or natural habitat and will require only minor grading. The natural gas pipeline route has been sited primarily underneath existing roads.

The following Site characteristics and Project design features limit the impacts to biological resources to a level that is less than significant:

- The Site was selected so that construction and operations will occur entirely within active agricultural land and, therefore, the Project will not result in the removal of natural vegetation or wildlife habitat.
- The Project design, construction and operation includes specific features to control the generation of fugitive dust so as not to affect surrounding agricultural operations.
- The Project's landscaping will assure that weedy species are not introduced to the Site or surrounding areas.
- Project lighting will be directed downward.
- The gas pipeline interconnection and water pipelines will be underground.
- Project construction and operation will include emission control measures to comply with relevant air quality standards, which also will protect biologic resources.
- Relevant standards for noise control will be followed during construction and operations that also will protect biologic resources from indirect impacts from noise.

- While no sensitive species are known to occur on the Site or linear corridors, the Project design includes provisions for a preconstruction clearance survey and an employee education program to assure that sensitive species are not adversely affected.
- Duke Avenal will contribute to the Center for Natural Lands Management (CNLM) for the temporary impacts of construction laydown areas and for disturbance by permanent site facilities.

1.8.6 CULTURAL RESOURCES

Based on literature, records searches, Site surveys, and Native American consultations, there is no evidence of important cultural resources occurring in the Project vicinity. Therefore, the Project is expected to have no impact to cultural resources.

1.8.7 PALEONTOLOGICAL RESOURCES

Literature, archival reviews and field surveys did not provide evidence of any paleontological resources that would be impacted by the construction or operation of the Project. No impacts to paleontological resources are anticipated.

1.8.8 LAND USE

The Project is located in the northeast corner of the City of Avenal, on industrial zoned lands, approximately 6 miles from the closest population center. The Planning Commission and City Council reviewed the Project and determined it to be consistent with the City of Avenal General Plan and Zoning Ordinance (City of Avenal, June 4, 2001). The Project represents a beneficial use of Avenal's industrial zoned lands that will help the City achieve the goals of the General Plan. Recognizing the benefits of the Project, City staff has been working with Duke Avenal for more than a year to plan the Project. The Project is a result of the City's effort and the continuing support by Kings County for the Project.

Design and operational features of the Project that help to minimize potential land use impacts are:

- The Site is located away from developed urban areas and is surrounded by agricultural lands. It is located at the outskirts of the City limits, in an industrial park.
- A large parcel of land has been acquired to allow for optimal placement of the facility and a large buffer zone from the main highway near the Site.

- The Project will be located to ideally utilize existing industrial infrastructure, including water and gas supplies and electrical transmission lines. Only relatively short tie-ins to these existing infrastructure systems will be required.
- The Project will be constructed on lands that are zoned industrial, so there will be no loss of lands designated for agriculture, open space, wildlife, recreation or other conflicting uses. The Project is consistent with the City's plan for industrial development in the area.
- The Site and infrastructure tie-ins occur on lands that have been extensively disturbed by agricultural activity. No disturbance of natural vegetation or wildlife habitat will occur.
- To minimize the impact of tall structures on aerial spraying applications, the Project will include lighting and visibility features on higher structures, as necessary (e.g., stacks).
- The Project will have limited visibility from Interstate 5 and will not be visible from the developed area of Avenal.

Based on consistency with existing zoning and City land use goals and minimal environmental impacts the Project will have an overall land use benefit.

1.8.9 SOCIOECONOMICS

The Project will employ a construction work force averaging approximately 240 persons for the 20-month period of construction, and an operations work force of approximately 30 for the life of the Project. Duke Avenal is committed to hiring from the local labor pool to the extent possible for construction and operation of the Project. The Project will result in direct and indirect beneficial socioeconomic effects. There will be an infusion of dollars from outside the local area in the form of monies spent for materials, equipment, wages and salaries. As a result, the Project will have a beneficial impact on the local economy. The City of Avenal supports development of the Project and has determined the Project is consistent with local land use plans.

Beneficial aspects of the Project related to socioeconomics are:

- Increased revenue to local vendors and suppliers from the $325-million Project.
- Reduced electricity prices and improved electrical power reliability for California businesses, residents and services.
- Maximum utilization of locally available skilled craft labor.
- Reduction of the area unemployment rate by Project employment opportunities.

- Increase in County and City property tax revenue with new operating assets.
- Increase in state and city sales tax revenues from purchase of equipment and supplies.
- Natural gas transportation franchise fees.
- Promotion of indirect and induced employment in the local area.

1.8.10 TRAFFIC AND TRANSPORTATION

The Site is located in an agricultural area that does not have traffic congestion. No significant impacts to traffic and circulation are expected. The following design features will limit potential construction impacts to a level that is less than significant:

- The Site is located adjacent Avenal Cutoff Road away from developed urban areas and surrounded by agricultural lands. The Project has excellent access to Interstate 5 and other highways and aerials that allow for efficient access to the Site for construction and operations.
- Construction deliveries and worker traffic will enter the Site from the Avenal Cutoff Road entrance where improvements (e.g., turning lanes) will be provided in accordance with City of Avenal requirements.
- Parking for construction workers will be provided on-site.
- The security gate with a turnaround circle will be within the property to ensure that vehicles waiting to enter the Site are not on the Avenal Cutoff Road.
- Construction traffic control procedures will be implemented addressing timing of heavy equipment and building materials deliveries.

Project operation will require a maximum of approximately 20 employees working during the day shift at the Site. The traffic generated by Project operations will not cause a significant impact to area roads.

1.8.11 NOISE

An ambient noise survey was conducted to quantify existing baseline noise levels in the Project vicinity as well as late night residual L_{90} noise levels at the nearest residential receptors. Future Project-generated sound levels would only increase cumulative residual L_{90} noise levels by no more than 2 dB above existing residual ambient noise levels, well within the Commission's allowable maximum increase of 5 dB. Further, project-generated sound levels would not exceed

the noise limit criteria established by City of Avenal and Kings County noise standards. Although the Project has the potential for increased noise levels during construction and operation, proposed Project design features will reduce noise impacts to a level that is less than significant at the nearest residential receptors.

1.8.12 VISUAL RESOURCES ANALYSIS

The Project would be located in the San Joaquin Valley, approximately 2 miles east of PG&Es Kettleman compressor station located along Interstate 5. The Site is bordered by the City of Avenal's water treatment facility, the San Luis Canal and land under agricultural production. The landscape in the Project vicinity is dotted with man-made features such as transmission towers, power lines, ranch structures, and water irrigation apparatus. The population density in the valley is less than 1 person per acre, with the closest residential structure located more than one mile from the Site. Because of the low population density in the area, most public views would be from the roadways in the Project vicinity. None of these roadways are designated as scenic roadways.

The Project has been designed and will be constructed to enhance the appearance of the City's industrial park area with minimal effect to views from surrounding areas. Nonreflective paint will be used for Site facilities. The landscaping plan includes perimeter screening vegetation and view corridors to achieve the City's visual goals for the Project. The landscape plan extends existing agricultural patterns (orchards, row crops and windrows of cypress) into the Site. Other Project features that limit visual impacts include:

- A large parcel of land has been acquired to allow for optimal placement of the facility and a large buffer zone from the main highway near the Site.
- The Site is located in a rural area with few homes.
- The Site occurs near a major existing high voltage transmission corridor so the transmission line interconnection will be short and located at the southeast corner of the Site to reduce visibility from Avenal Cutoff Road.
- The Site is located almost 2 miles from Interstate 5, and approximately 200 feet lower in elevation than the freeway. The distance and orientation will reduce the visibility of the Project from Interstate 5.
- There will be a large setback between Avenal Cutoff Road and Site facilities to permit substantial landscaping between the facilities and the Road.

Based on a detailed evaluation of five key observation points, the Project, including landscaping enhancements incorporated in the proposed design, will have neutral to positive visual affects.

1.8.13 WASTE MANAGEMENT

Wastes generated by the Project during construction and operation will be recycled to the extent practicable. Appropriate procedures and personnel training will provide assurance that non-hazardous and hazardous wastes are properly handled and do not significantly affect the environment or health and safety. Waste will be minimized and disposal of waste from the Project will not significantly impact the capacity of the disposal facilities identified as available for use by the Project. With active recycling efforts in place, the incremental waste disposal capacity needed by the Project is not significant.

1.8.14 HAZARDOUS MATERIALS HANDLING

The Project will implement accident prevention and response planning measures to reduce the risk associated with use and storage of hazardous materials. Quantities of hazardous materials used or stored on-site will be evaluated to determine which exceed threshold levels of federal and state risk management and process safety requirements. Duke Avenal will prepare a Hazardous Materials Business Plan/Contingency Plan in accordance with California Code of Regulations (CCR) Titles 19 and 22, a Spill Prevention Control and Countermeasure Plan (SPCC) in accordance with Code of Federal Regulations (CFR) Title 40, and a Storm Water Pollution Prevention Plan (SWPPP) in accordance with California Regional Water Quality Control Board (RWQCB) requirements. Each of these management plans includes detailed measures designed to prevent or respond to discharges, spills, leaks or other incidents involving hazardous materials. Bulk tanks will be provided with secondary containment to contain leaks or spills. Safety showers and eyewashes will be provided in appropriate chemical storage and use areas. Personnel who may potentially handle hazardous materials will be trained to perform their duties safely and to respond to emergency situations that may occur in the event of an accidental spill or release.

1.8.15 PUBLIC HEALTH

Aspects of the Project that benefit public health include the use of an optimized stack height to reduce ground-level concentrations of emissions, and the sole use of clean-burning natural gas for fuel. These design and operating aspects will keep potential public health impacts below a level of significance.

The Project will use advanced combustion turbine technology to minimize emissions of pollutants and, therefore, to minimize potential effects on public health. Potential health risks are comprehensively assessed in Section 6.16 of this AFC and determined to be below their significance thresholds. Because future public health risks will be below significance criteria, no residential or sensitive receptors will be impacted. Sensitive receptors nearest the Project are located in the main part of the City of Avenal, at a distance of more than 6 miles to the southwest. The closest residence is located more than 1 mile from the Site.

Beneficial aspects of the Project regarding protection of public health include the following:

- Clean-burning natural gas as fuel.
- Advanced combustion turbine technology to minimize the amount of fuel needed to produce electricity.
- SCR to minimize NO_x emissions.
- Optimized stack height to reduce ground-level concentrations of exhaust pollutants below public health-related significance thresholds.
- Selection of a Site that is in an area with low population density and located far from the nearest farmhouse or sensitive receptor.

1.8.16 WORKER SAFETY

Worker safety is a high priority for Duke Avenal. The practices and procedures that will be used have evolved at Duke Energy-owned power plants for many years, achieving an excellent safety record and continuous compliance with applicable LORS. Duke Energy maintains an extensive health and safety program in compliance with current laws and standards and will continue to implement this program in support of safe Project operations.

Beneficial factors of the Project related to worker safety are:

- Use of a proven operations health and safety program.
- Ongoing worker training to assure safe work practices and coordinated emergency response.
- Development of a comprehensive site-specific construction health and safety program.

1.8.17 TRANSMISSION LINE SAFETY AND NUISANCE

The Project transmission line interconnection will consist of approximately 7,000 feet of new double-circuit, 230 kV transmission line extending from the southeast corner of the Site to the nearby PG&E transmission corridor. Beneficial aspects of the Project include:

- The Project is located proximal to a major electrical transmission corridor, so only a short segment of new line construction will be required.
- New line construction will occur in an agricultural area, away from homes and other populated areas.
- The Project will use a "loop-in" connection to interconnect with the existing transmission line. This connection reduces the need for more extensive transmission lines and corresponding right-of-ways.

The Bonneville Power Administration Corona and Field Effects Program (BPA Program) model was used to calculate the electric and magnetic fields for the new 230 kV double circuit tower line that will connect the Site switchyard to the existing PG&E 230 kV line. While California does not have regulatory levels for electric field strength, the BPA modeling shows that the electric and electromagnetic fields will be within standards set by other states that do have regulatory limits. In addition, no impact to current audible noise or radio and TV interference is expected from the Project.

1.9 SUMMARY

The Project will provide benefits and diversity to the local economy and will help California meet projected power generation resource needs. By employing natural gas-fired, advanced combustion turbine technology and state-of-the-art emissions control systems, the Project will provide a highly efficient and environmentally sound source of electricity for California's restructured electricity market.

Environmental impacts associated with construction and operation of the Project have been considered by Duke Avenal throughout the planning process. In those instances where potential impacts on the environment have been identified, design measures have been implemented to ensure that impacts are limited to a level that is less than significant.

Furthermore, by working with the local government representatives and their advisory commissions, the Project has secured a firm source of municipal and industrial water. The movement of surface water into the Kings County provides a net benefit to the local area and enables the Project to rely on groundwater only as a backup supply that is offset by conservation measures.